KB3010 GPRS DTU
User Manual

Shenzhen Kingbird Network Technology CO.,LTD

Add: 29H, Tower B, Haiwang Building, NanHai Road, Nanshan District, Shenzhen, Guangdong, China

TEL:+86-755-82556825 / 83239613 **Fax: +86-755-83239613 EXT.: 8012**

Web: http://www.kingbirdnet.com **EMAIL: sales1@kingbirdnet.com**

MSN: kingbird_sales1@hotmail.com **SKYPE: kingbird_sales1**

1 Brief Introduction

Thanks for you to use our products!

1.1 Brief Introduction

KB3010 GPRS DTU (Data Terminal Unit) is wireless data transmitting terminal of GPRS and embedded with High reliable ARM7 CPU.

Based on the public net, KB3010 GPRS DTU transmit widely, stably and reliably, KB3010 GPRS DTU is widely used in unattended operation device, Remote AMR, remote data acquisition, remote AMR, remote scheduling and so on. Due to this product is designed for industry integrated, we adopt special designs in the temperature scope, shaking, EMC and interface multiform and so on, to keep it good stability in the severe atmosphere, ensure high quality for your device.

Aim at different scope user's requirements to supply different define GPRS Terminal unit, it needs taking industry characteristics for developing on hardware & software and system integration. GPRS mobile net can supply TCP/IP connection; GPRS DTU can be use for internet connection, data transmitting application and so on. KB3010 GPRS DTU (Data Terminal Unit) is special GPRS wireless device that send the data from COM port through GPRS mobile data network.

KB3010 GPRS DTU is used in electric power automatic system, industry monitoring, traffic management, atmosphere, pro-environment, pipe network monitoring, finance, securities departments and so on. Consider the networking request from different application scope, achieve Virtual data private network in network structure. It is applicable to small and medium data transmitting of the Center to multi-points, multi-points scatter.

1.2 Safe Use

KB3010 GPRS DTU Completely complied with national radio product safety technical regulations.

Warm Tip: You must not touch the antenna with your hands or body. During 15 seconds after KB3010 DTU started, Please keep away from the antenna. If the antenna is damaged, you must replace it in time, assorted and qualified cable and antenna.

1.3 EMI

Now most electric device all has electromagnetic pulse hardening, but some old device may have no, under RF power radiation, it may go wrong. When you use KB3010 GPRS DTU, please check the device nearby have electromagnetic pulse hardening or not.

1.4 Appearance and Interface

KB3010 GPRSS DTU has three physical interfaces:

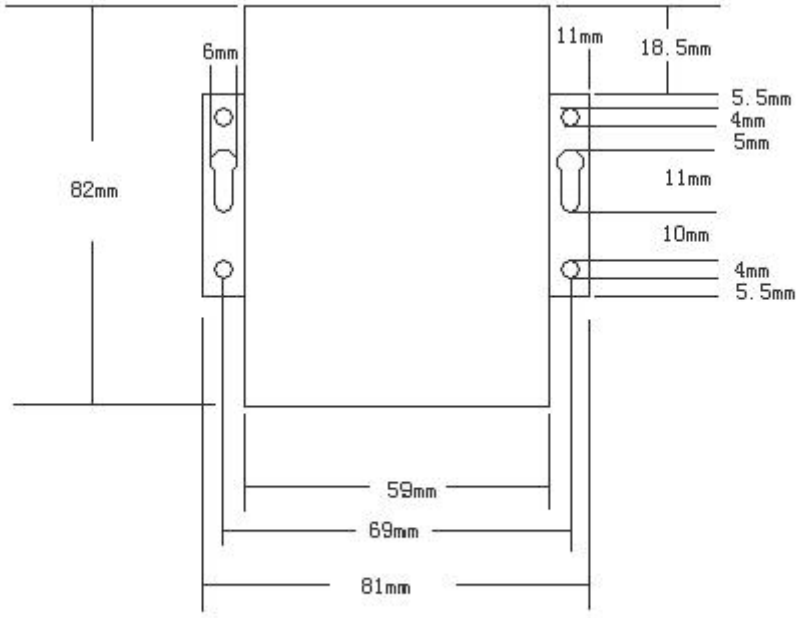
. The first is 10 pins main interface: RS232/RS485, Power supply, Modem COM port

. The second is SMA RF interface: for the antenna

. The third is embed SIM socket: for SIM card

. Size: 82mm(L)*59mm(W)*25mm(H)

. Weight: 180g



2 Technical Specification

2.1 GSM/GPRS：

Frequency Band: EGSM900/DCS1800

GPRS Multi-slot Class 12

GPRS Mobile Station Class B

GPRS Coding：CS1~CS4

Output Power: Class 4 (2W) at EGSM900MHz

Class 1 (1W) at DCS1800MHz

Sensitivity: 108 dBm (typ.) at EGSM900 MHz 106 dBm (typ.) at DCS1800MHz
Compatible standard AT command（GSM07.05 and 07.07）
Support extend command
Support SMS、USSD、CSD
Embed TCP/IP Protocol

2.2 Basic Function：

Embed TCP/IP Protocol
Compatible standard AT command（GSM07.05 and 07.07）
Support extend command
Support SMS, USSD, CSD
Transparent data transmitting
Support IP address or domain name
Support special APN

2.3 User Interface

1.User Interface: Interface as follow (From left to right):

VCC	GND	UTXD1/A	URXD1/B	Output	Input1	UGND	UTXD2	URXD2	Input2

Pin No.	Definition	Description	For User
1	VCC	RS232:DC5~16V,RS485:5V	positive pole of Power supply
2	GND	Ground	negative pole of Power supply
3	UTXD1	TXD (DTU COM/RS485: A)	RS232,TTL:RXD; RS485:A
4	URXD1	RXD (DTU COM/RS485: B)	RS232,TTL:TXD; RS485:B

5	Output	Output of IO	User's input pin
6	Input1	Input No.1 of IO	User's output pin
7	UGND	Ground (COM)	RS232,TTL, RS485:Data groud
8	UTXD2	TXD (MODEM COM)	GPRS Modem
9	URXD2	RXD (MODEM COM)	
10	Input2	Input No.2 of IO	User's output pin

Red LED: power light, will light after power-on.

Green LED: Communications light, when it connect Server OK, it will often light green, otherwise, it will flash.

2. SIM Card Interface

SIM Card Interface is on the left of the antenna. When you plug in the SIM card, please note the direction and front /back side. SIM Card must be put the IC side down, the nick side forward and away from the SMA antenna pedestal. Just as below picture:

Notes: Please don't plug or move SIM card after power-on, if you need to plug and move, please put equipment blackouts first.

2.4 Electric Specificity

Work Voltage: RS232: 5V～16V DC,RS485:5V DC

Power:

Standby: < 30mA@5V

Communicating: < 100mA@5V
Launched peak: 1A@5V

2.5 Circumstances Specificity

Working Temperature: -30℃～80℃
Storage Temperature: -40℃～125℃
Relative Humidity: 20%~ 95%（No Condensation）

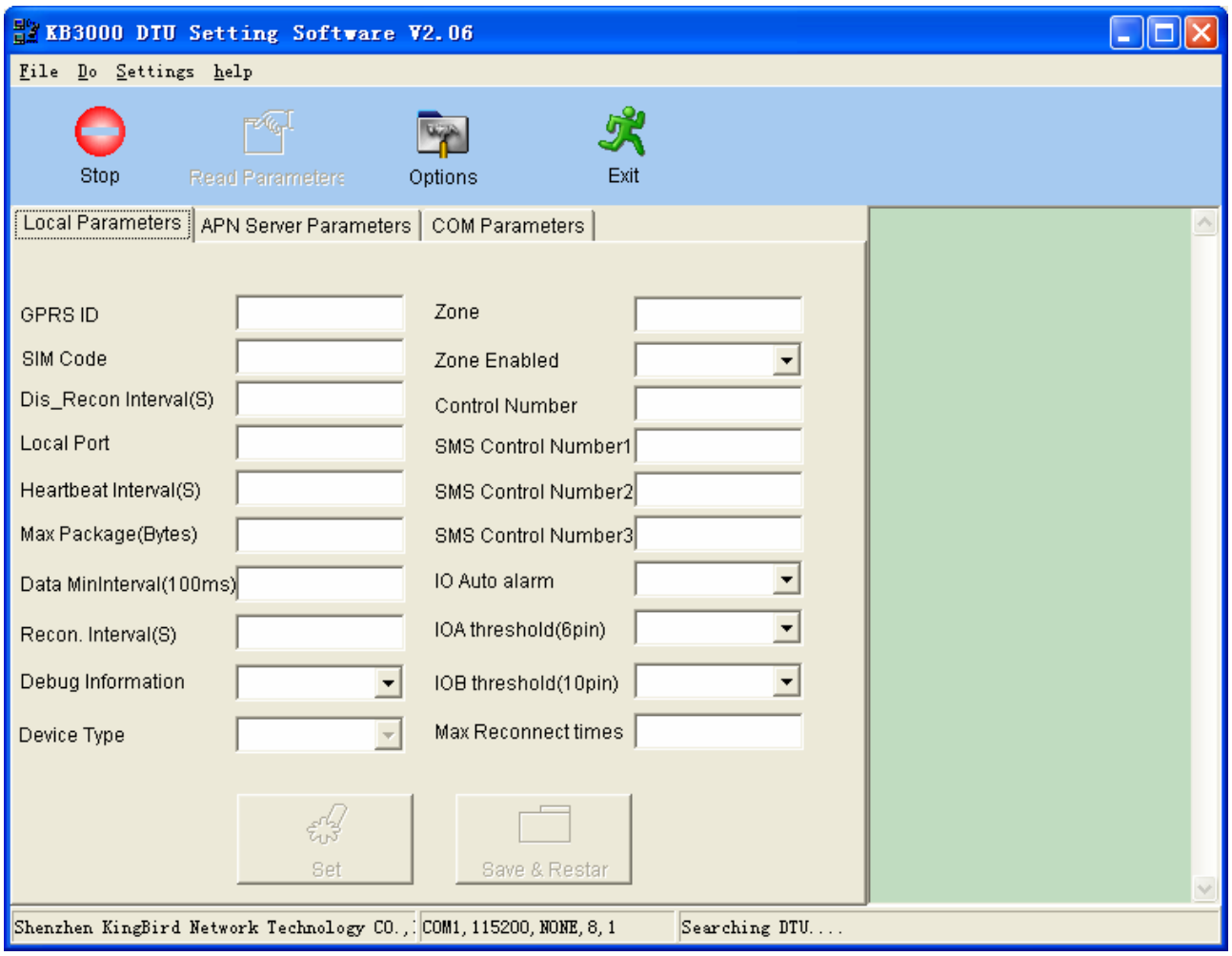
3 Terminal Setting

When you set KB3010 GPRS DTU, you are advised to use KB3010 DTU Setting Software (GPRS_DTU.exe). Introduce as follow:

Operating step:

1. Connect the interface of KB3010 to PC (KB3010 interface is COMA)
2. Run configuration software, tips are as follows:

Click OK, and enter the interface configuration software, as follows:



3.This software will automatically open corresponding serial search DTU, processing, please confirm whether the serial port which opened by software is the serial port connected with KB3010 DTU, if not, please click the “stop” button in toolbars in the menu options from the file, then change information in COM parameters settings window. (Note: configuration parameters are fixed by 115200bps)

4． Connect the KB3010 to the power supply, the system will prompt that search DTU successfully in 5 seconds and show as below:

5． Click Read in toolbars, the software will read the parameters, and display the parameter of DTU.

Local parameter:

GPRS ID: GPRS DTU the only mark, important at communication.

SIM Code: The SIM card number is only for user record.

Dis_Reconnection interval: The interval of DTU re-connects with backup server or the Main server when DTU connection error or disconnected with Main server or backup server.

Local port: DTU local TCP or UDP port.

Heartbeat interval: The interval of server with DTU's heartbeat for units in seconds, scope: 0-300S.

Max package: To send data packet maximum DTU data bytes (optional 512 bytes) or 1024 bytes.

Data Mininterval: The smallest interval packets (0-1000ms) serial receives data between two value is less than this if a packet, 1~10 units for 100ms.

Recon. Interval:No Response reconnection cycle, if it do not received answer from server for some time, DTU will reconnect with the server. The value scope: 0-3600s. If you set this parameter to Zero, DTU will not reconnect.

Debug information: You can set DTU output its working state information or not. None: DTU will not output working state information; Normal: DTU will not output Sample working state information; Detail: DTU will output detailed working state information. When you connect DTU with your device, please set this parameters value to NONE, in order to avoid output information affect users of the equipment.

Device type: Three types as DTU, Modem, SMS. This parameter just can be read, when user set type as DTU, then forbid to amend this parameters.

Zone: The working code DTU belongs. Generally we just use this parameter when networking.

Zone Enabled: The enabled or disabled working code which DTU belongs to.

Control Number: The phone number which control sleep or awake DTU and amend the parameters of DTU by SMS, user can dial this number to control DTU sleep or awake, sleep mode can save a lot of GPRS Flow Fee, DTU will be sleep or awake by any call if this value is none, so user is advised to set a phone number.

SMS control number: This number works When DTU working as SMS Modem, it can be set three numbers, after set the number, only these three numbers can message DTU, if no number, then any phone number can message it.

IO Automatic alarm: When set it "ON", it will send alarm signal to server automatically, otherwise, it won't

IOA threshold (6 pin): When the IO automatic alarm is opening, set the situation of IOA as high level or low level, the DTU interface is the sixth terminal from left to right.

IOB threshold (10 pin): When the IO automatic alarm is opening, set the situation of IOB as high level or low level, the DTU interface is the tenth terminal from left to right

MAX reconnection times: DTU will restart when it can not connect in how many times.

APN Parameter And Server Parameter:

APN: Name of GPRS Access Point. In China: cmnet

User name: Name of login GPRS account. When using VPN networking, user name must be input.

Password: the password when DTU login GPRS.

Main server IP: IP Address of main server connected with GPRS DTU.

Main server port: Port of main server connected with GPRS DTU.

Network protocol: The protocol of main server connected with GPRS DTU, include two types as TCP & UDP.

User Protocol: Single, Normal, Transparent, normally set it as "Single" if no special requirement, user is

forbidden to change.
Backup server IP: IP Address of Backup server connected with GPRS DTU. User can set this parameters same as main server's.
Backup server port: Port of Backup server connected with GPRS DTU. User can set this parameters same as main server.

COM Parameter:

Baud Rate: The speed of GPRS DTU adopted, support from 300 to 115200bps.
Data bits: The data bits of GPRS DTU COM data, support four kinds of bits as 5/6/7/8.
Stop bits: The stop bits of GPRS DTU COM data, support three kinds of bits as1/2/1.5, generally the stop bits is 1bit.
Verify: The way of checking GPRS DTU COM data, Classify it to None, Even, Odd, Mark, Space, etc.
Flow Control: Com data transmission classify to none flow control, hardware flow control, software flow control. None flow control is in genaral.

Notice: After choose or import parameters, and click Set button, software will prompt:

Now, if you need to change others parameter, please choose NO, after changed others parameter, then click Set ,will prompt it again, DTU will restart , and exit the Parameters configuration state after choose Yes, If you need to change parameter again, you should to outage DTU and re-search after Power-on.

4. KB3010 Application Guide

4.1 Operation Steps:

(1). Plug in SIM card;
(2). Connect the antenna;
(3). Set DTU Parameters;

Connect the data cable. DTU's user interface is 10PIN socket, If DTU is RS232 interface, you can connect it with DB9 of COM port, if DTU is RS485 interface, and you can use one converter of RS232-RS485 to connect it with DB9 of COM port.

Run the configuration software, choose and open all the COM port that DTU connected;

Connect with the Power. The power adaptor(5V) is One of the enclosures，first you can plug the power adaptor into the power socket, then connect the male into the female socket of the power cable. DTU can get power. KB3010 DTU Setting Software will list the menu of configuration. You can choose different menu to set different parameters, such as server IP, port, baud rate and so on. (Baud rate and Verify must be same with the device), then save the parameters and reset DTU.

(4)．Connect DTU with the device

Connect DTU with the device according to the interface define of DTU. If DTU is RS232 interface, you can connect it with the device of RS232, if the DTU is RS485 interface, you can connect it with device of RS232.

(5)．Star the control center software/GPRS server software and the SCADA software.

4.2 User utility software R&D and server planning

Users need planning on R&D software which in GPRS application, user can choose fixed IP servers or dynamic domain mode. Based on dynamic DNS is unstable, User is not advised to adopt this way. Here is the explain for the planning on software R&D based on fixed IP servers

Fixed IP server user can rent or hosting ISP Internet service provider, or can apply special line to our server.

Generally speaking, user's monitoring software can divide into two modes:

One is the user monitoring software and Data center software (Data center) integration. Namely the user monitoring software is installed on the Server, and its working mode as Server, it communicate with and manage every scene DTU directly, the advantage of this way is communication directly, no data transfer, Disadvantage is that the flexibility for application is not strong, server must be in the user's master-control room (special line). So that users just can monitor and data collect in that server only.

Another is the user monitoring software and Data Center software (Data Center) separation, Data Center dedicated to Data transfer and each machine DTU’s management, monitoring software only in charge of the customer's business logic processing, it communicate with Data Center software through network, and it with Data Center software is C/S architecture, the monitoring software working mode as Client, and Data center as Server. The advantage of this way is very flexible application, user no need special line, only need place the server in ISP service provider, and install Data center software into server. User can manage it only by user’s monitoring software, and when monitoring software install into a computer which connect with internet, it can achieve communication even in company or on business trip outside. The disadvantage of this mode is data need to transfer, monitoring software is not communicate with DTU directly, But communicate with data center software first, and then forward data to scene DTU.

Users can plan the whole GPRS application system according to user’s request. Normally, users are suggested using the second modem, our company's server and server software is available to offer a lot of support when user debugging and trial in the early time. If users develop software completely, Our company can offer SDK or Demo program when user monitoring software work as the server (when user monitoring software and data center software is integration) or Client (when user monitoring software and data center software is separation).

5. “Plug and play” of KB3010

When users don't want to or can not do software development based on customary communication to use GPRS, then can use “plug and play”. If user can develop software, then need not to use "plug and play".

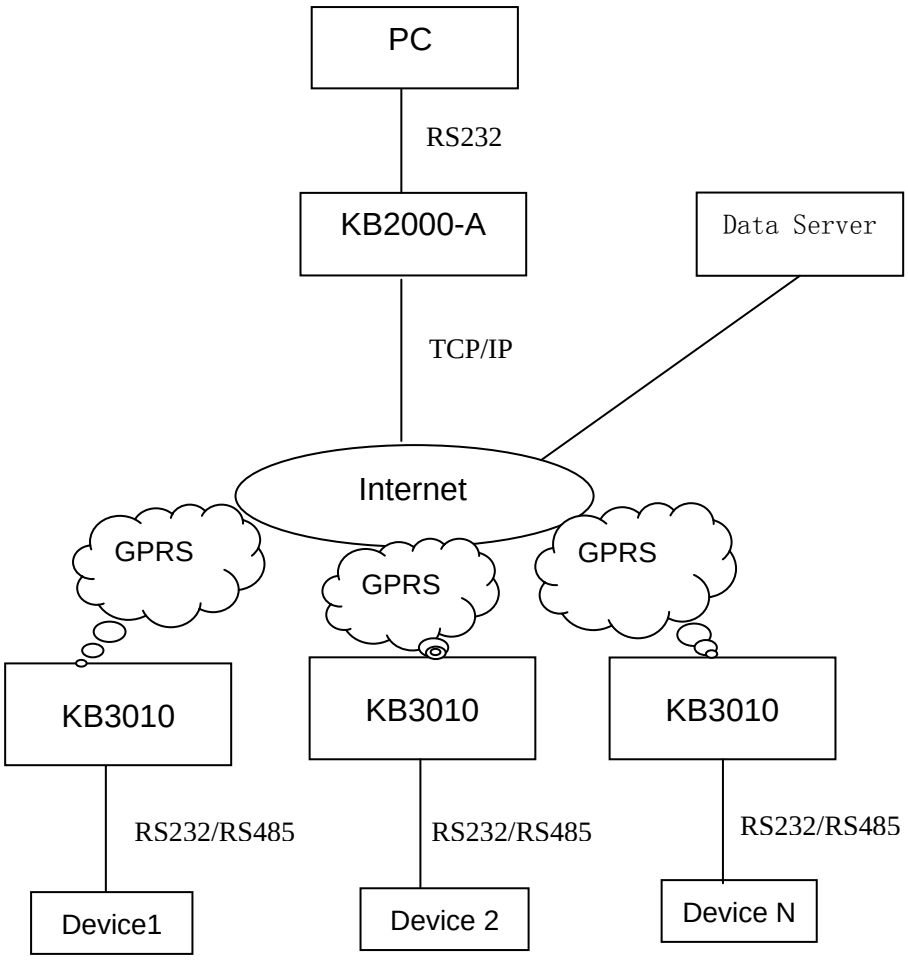
Normally, users monitoring software based on serial communication mode before user use GPRS, if user want to use GPRS system, user is advised to change the communication mode to network communication mode, meanwhile, Put the protocol of GPRS DTU in monitoring software (Invoke SDK from DTU manufacturers) and building server and so on many developments and applications. My company recommends "plug and play" solutions, user doesn't need to change its monitoring software, when users get our product, through my company's some software support, it can achieve remote GPRS communication through the monitoring software base on COM port communication modem. User can build a large SCADA system with our products and software in 10 minutes. In early time user debugging and try our products, user can use our server. If the bulk application is still need to adopt our company server, also can lease my company server.

Our company products "plug and play" solution requires our server software (Center Data) to support, the following various network scheme adopts our company's server software (installed in users server or our company server).

5.1 KB3010 work with KB2000

KB3010 GPRS DTU can be used with KB2000-A (our product). if your software is based on serial COM, and device is COM port too (RS232 or RS485), then you can choose this Plan. This network is plug and play way. It need not any development of software and hardware. User need to hire our company’s server. It can peer to peer and center to multi-point. This type network is very suit for the situation that device and the PC software are based on the COM port communication, and they need remote communication. Such as LED display information release and so on.

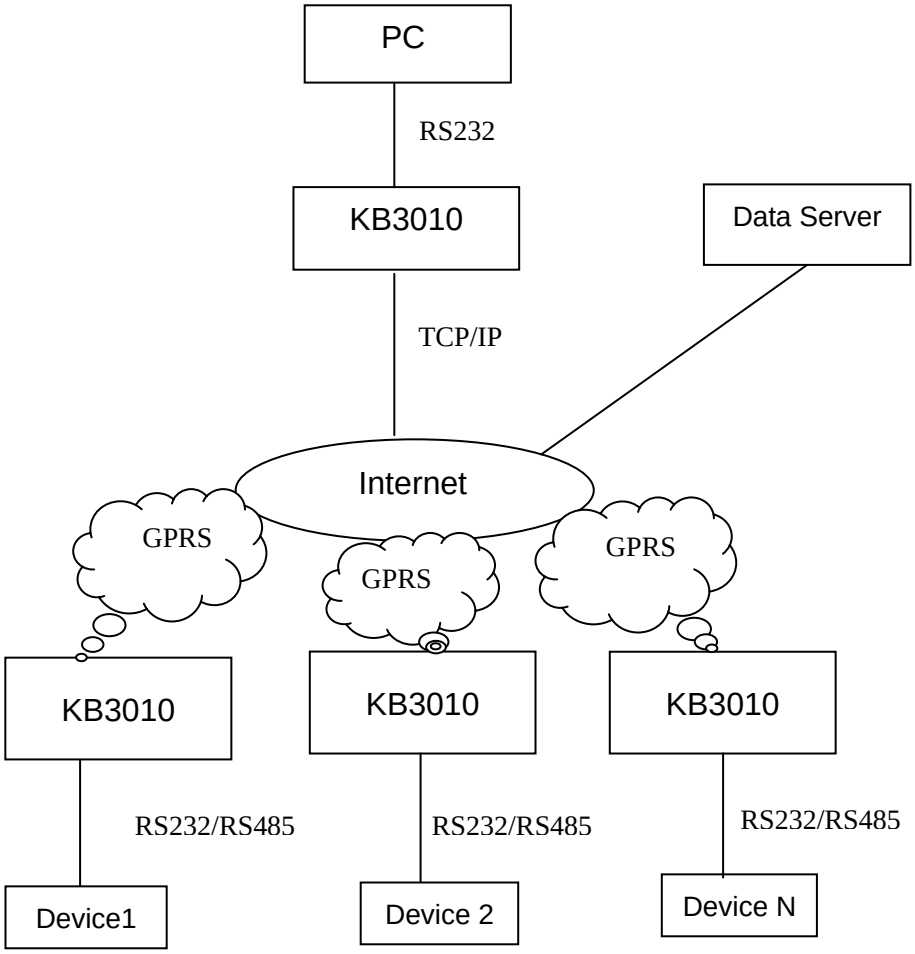
The network topology as follow：



5.2 KB3010 work with KB3010

KB3010 can use with KB3010. When master control room has no condition to surf the internet, user can use a KB3010 as main station, and use another KB3010 connected with device as slave station. This way is called plug and play (foolish application), no need to develop any software. User can use own server, or ours. Not only peer to peer, but also center to multi-point. This type network is very suit for the situation that main controlled room has no condition to surf the internet or outdoor, but need remote data communication.

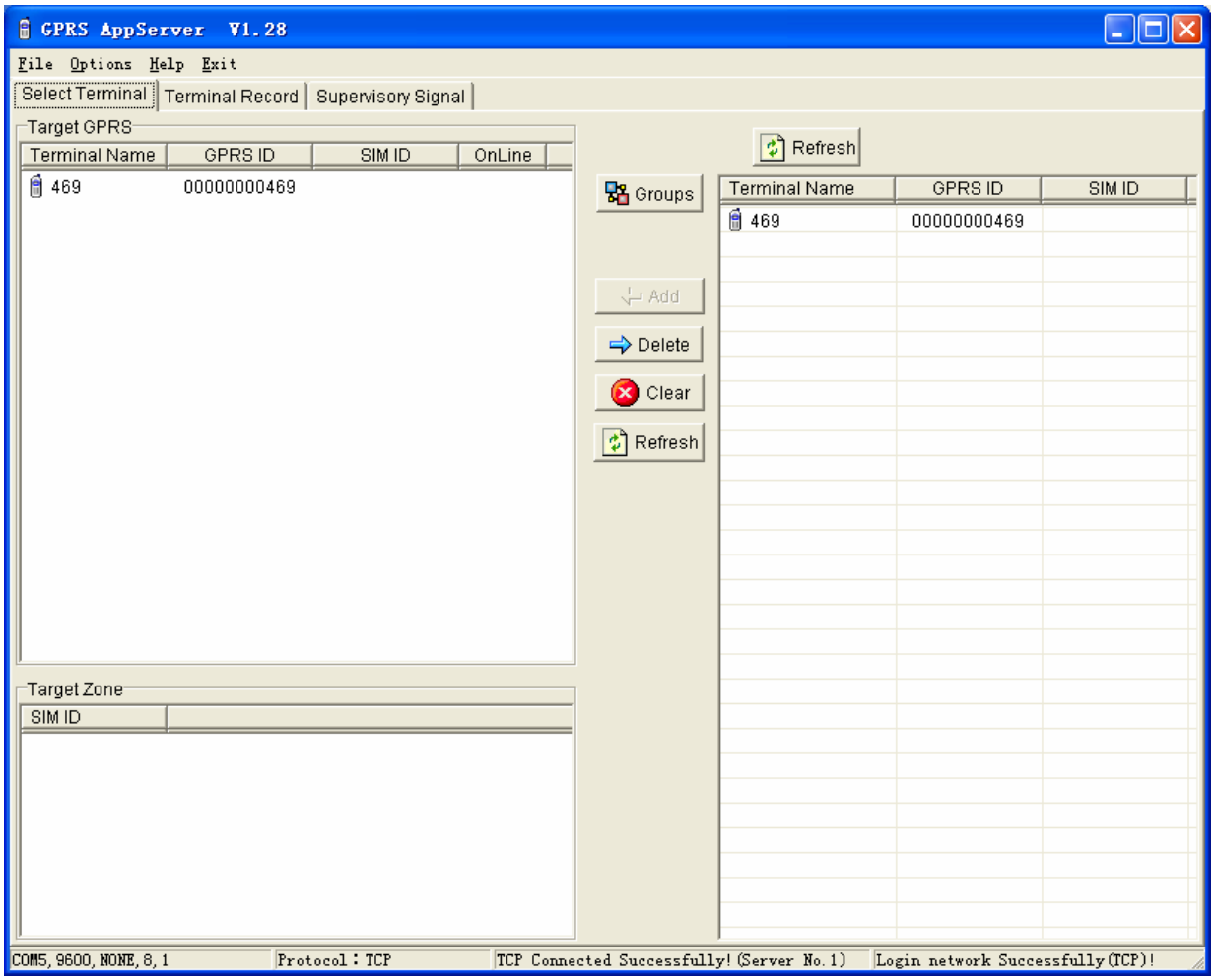
Connected net system structure as follow：



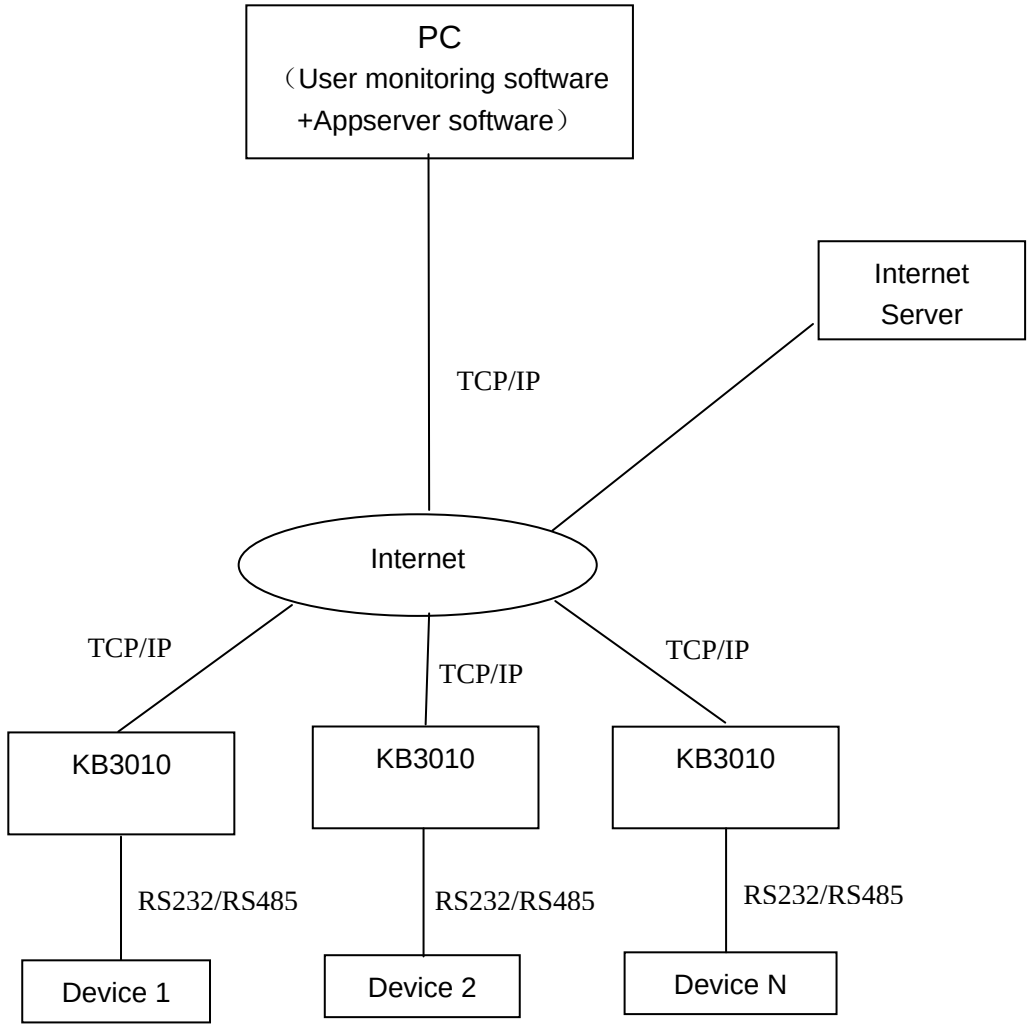
5.3 Appserver software work with KB3010

Appserver software is the client-side communication software developed by our company and application in one single host or multi host system, the single host or multi hosts in network are need data communications with the equipment. Appserver software can combine to use with user's device control software (based on COM port), it can obtain the data in user's device control software through COM part and send the data to the KB3010. In this way, when a host needs to communicate with device, Appserver software send TCP connection request to designated server, then communication with it. At the same time, the KB3010 which connected with device sends the TCP connection request to server, after connection established, KB3010 can communicate with server, then user can use Appserver software in host communicate with every KB3010 through server. This network mode is very suitable for that equipment and PC software are serial communication mode, and need for remote data communication projects. Such as, LED display information issue system and so on.

The Appserver interface as follow:



The system schematic structure as follow:


PC
（User monitoring software
+Appserver software）
Internet
Server
TCP/IP
Internet
TCP/IP
TCP/IP
TCP/IP
KB3010
KB3010
KB3010
RS232/RS485
RS232/RS485
RS232/RS485
Device 1
Device 2
Device N